

CLAIMS

1. A method of treating textiles, in particular fabrics, fibers, or yarns comprising treating fabric, fiber, or yarn, in an aqueous medium, with a carbohydrate oxidase and/or a fatty acid oxidizing enzyme.
2. A method of claim 1, comprising treating fabric, fiber, or yarn, in an aqueous medium, with an effective amount of a carbohydrate oxidase having activity towards monosaccharides and at least one of di-saccharides and oligo-saccharides, and a substrate for said carbohydrate oxidase.
3. The method according to claim 1 or 2, wherein the fabric, fiber, or yarn is a cellulosic material.
4. The method according to claim 3, wherein the cellulosic material is a cotton-containing material.
5. The method according to any of claims 1 to 4, wherein the carbohydrate oxidase is derived from fungi, from bacteria, or from algae.
6. The method according to claim 5, wherein the carbohydrate oxidase is derived from *Microdochium*.
7. The method according to claim 6, wherein the carbohydrate oxidase is derived from *Microdochium nivale*.
8. The method according to claim 1 or 2, wherein the concentration of the carbohydrate oxidase is in the range of from about 0.05 U/ml to about 10 U/ml.
9. The method according to claim 8, wherein the concentration is in the range of from about 0.5 U/ml to about 5 U/ml.
10. The method according to claim 9, wherein the concentration is in the range of from about 1 U/ml to about 3 U/ml.
11. The method according to claim 1 or 2, wherein the carbohydrate substrate is selected from the group consisting of alpha-glucose, beta-glucose, xylose, cellobiose, maltose, arabinose, galactose, fructose, maltriose, lactose, and mannose.

12. The method according to claim 1 or 2, wherein the concentration of the concentration of the carbohydrate oxidase substrate is from about 1 to about 200 mM.
13. The method according to claim 12, wherein the concentration is from about 3 to about 75 mM.
- 5 14. The method according to claim 13, wherein the concentration is from about 10 to about 40 mM.
15. The method according to claim 1 or 2, wherein the peroxide generating step is carried out at a pH in the range of about 5.5 to about 9.
- 10 16. The method according to claim 1 or 2, wherein the bleaching is carried out at a pH in the range of about 10 to about 13.
17. The method according to claim 1 or 2, wherein the aqueous medium is added a peroxide activator.
18. The method according to claim 17, wherein the activator is silicate.
- 15 19. The method according to claim 1 or 2, wherein the substrate is generated *in situ* with another enzyme or chemical system.
20. The method according to claim 19, wherein the enzyme system comprises at least one of the enzymes from the group consisting of cellulase, xylanase, mannanase, amylase, arabinase, galactase, pectinase and glucanase.
- 20 21. A composition for use in a method of treating fabrics, fibers, or yarns comprising a carbohydrate oxidase having activity towards monosaccharides and at least one of disaccharides and oligo-saccharides and a substrate for said carbohydrate oxidase.
22. A method of any of claims 1 to 21, comprising a step of treating the textile in an aqueous medium with one or more fatty acid oxidizing enzyme.
23. The method of claim 22, wherein the treatment is a bleaching step.
- 25 24. The method of claim 23, wherein the bleaching step is followed by an alkaline treatment step carried out at a pH above 8, preferably between 9 and 13.

25. The method of claim 24, wherein the alkaline treatment step is carried out at a temperature of between 80°C and 100°C.
26. The method of claim 22, wherein the treatment is a scouring step.
27. The method of claim 26, wherein the scouring step is carries out in the presence of a
5 pectinase, preferable a pectate lyase.
28. The method of claim 26 or 27, wherein the scouring step is carries out in the presence of a lipolytic enzyme, preferable a cutinase or a lipase.
29. The method of any of claims 26 to 28, wherein the scouring step is carried out at a pH above 9, preferably between 9 and 13.
- 10 30. The method of any of claims 26 to 29, wherein the scouring step is carried out a temperature between 10°C and 100°C.
31. The method of claims 22, wherein the treatment is a desizing step.
32. The method of claim 31, wherein the desizing is carried out in the presence of an alpha-amylase, preferably a *Bacillus* alpha-amylase.
- 15 33. The method of claim 31 or 32, wherein the desizing step is carried out in the presence of a lipolytic enzyme, preferably a cutinase or a lipase.
34. The method of any of claims 31 to 33, wherein the desizing step is carried out at a pH between 5 and 9, preferably 6 and 8, especially around 7.
35. The method of any of claims 31 to 34, wherein the desizing is carried out at a
20 temperature between 50°C and 100°C, preferably 60°C to 80°C.
36. The method of any of claims 22 to 35, wherein the fabric, garment, or yarn is a cellulosic fabric, such as denim.
37. The method of any of claims 22 to 36, wherein the fabric, garment, or yarn is a silk fabric or a wool fabric.
- 25 38. The method of any of claims 22 to 37, wherein the fatty acid oxidizing enzyme is applied together with an additional enzyme selected from the group consisting of: a

proteolytic enzyme, a lipolytic enzyme, a cellulolytic enzyme, an amylolytic enzyme, a pectolytic enzyme, an oxidase enzyme, or a peroxidase enzyme, or mixtures hereof.

39. The method of any of claims 22 to 38, wherein the fatty acid oxidizing enzyme is a lipoxxygenase, preferably obtainable from fungi, from bacteria, or from algae.

5 40. The method of claim 39, wherein the lipoxxygenase is derived from the genus *Magnaporthe*, preferably *Magnaporthe salvinii*.

41. The method of any of claims 22 to 40, wherein the fatty acid oxidizing enzyme is added in an amount from 0.001 to 400 U/ml treatment liquor.

10 42. The method of any of claims 22 to 41, wherein the fatty acid oxidizing enzyme is added together with a substrate for the fatty acid oxidizing enzyme, preferably linoleic acid (LA) and/or linolenic acid (LNA).

43. The method of any of claims 38 to 42, wherein the amylolytic enzyme is an amylase, preferably an alpha-amylase, especially a *Bacillus* alpha-amylase.

15 44. The method of any of claims 38 to 43, wherein the lipolytic enzyme is a cutinase or a lipase.

45. The method of any of claims 38 to 44, wherein pectolytic enzyme is a pectate lyase.

46. The method of any of claims 38 to 45, wherein the oxidoreductase is a carbohydrase oxidase, peroxidase or laccase.

20 47. The method of any on of claims 22 to 46, wherein the aqueous medium contains a surfactant, preferably a non-ionic surfactant, such as a non-linear surfactant.

48. A composition comprising a fatty acid oxidizing enzyme and in addition thereto at least one adjuvant, preferably a wetting agent, polymeric agent and/or dispersing agent.

25 49. The composition of claim 48, wherein the fatty acid oxidizing enzyme is a lipoxxygenase, preferably is derived from the genus *Magnaporthe*, especially a strain of *Magnaporthe salvinii*.

50. The composition of claim 48 or 49, wherein the composition further comprises an enzyme selected from the group consisting of: a proteolytic enzyme, a lipolytic enzyme, a

cellulolytic enzyme, an amylolytic enzyme, a pectolytic enzyme, an oxidase enzyme, or a peroxidase enzyme, or mixtures hereof.

51. The composition of claim 50, wherein the further enzyme is a cutinase.

52. The composition of claim 51, wherein the further enzyme is an amylase.

5 53. The composition of claim 52, wherein the further enzyme is a pectate lyase.

54. Use of a carbohydrate oxidase for treating textiles, in particular treating fabrics, fibers, or yarns.

55. Use according to claim 54, wherein the carbohydrate oxidase is an enzymes mentioned in any of claims 1 to 53.

10 56. Use according to claims 54 or 55, for bleaching textiles.

57. Use according to any of claims 54 to 56, for improving the whiteness of textiles.

58. Use of a fatty acid oxidizing enzyme for treating textiles, in particular treating fabrics, fibers, or yarns.

15 59. Use according to claim 58, wherein the fatty acid oxidizing enzyme is an enzyme as defined in any of claims 22 to 50, in particular a lipxygenase.

60. Use according to claims 58 or 59 for bleaching textiles.

61. Use according to any of claims 58 to 60, for improving the whiteness of textiles.